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APPLICATION NO. 05/222,387	FILING DATE 12/22/97	FIRST NAMED INVENTOR AHLGREN	ATTORNEY DOCKET NO. 41939-03
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EXAMINER TARAZANO, D

ART UNIT 1773	PAPER NUMBER 12
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DATE MAILED:

04/21/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/996,367

Applicant(s)

Ahlgren et al.

Examiner

D. Lawrence Tarazano

Group Art Unit

1773



☒ Responsive to communication(s) filed on both Nov 18, 1999 and Feb 7, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-56 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-56 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 10

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Priority

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CFR 1.78). In this instance the applicants only make reference to the latest application (08/747,241) (Transmittal papers), reference should be made to all the applications in the series.

The examiner notes that the applicants have requested a corrected filing receipt in paper 9 (page 32) which make reference to all the patent applications in the series; however, the examiner asks applicants to make this request on a separate paper so that it can be more easily corrected.

Specification

On page 8 of the specification the applicants make reference to US patent 1,209,825 as being a Du Pont patent relating to VOCl_3 catalysis; however, the recited patent is a 1916 patent to Erickson relating to a rotary dial for a telephone. The examiner asks if the applicant can determine to what patent is being referred. The examiner suggests that the applicants provide a copy of the patent in question, correct the specification, provide appropriate reasons of how this error occurred, and reasons why this correction does not constitute new matter. For example, a digit is off in the number, and this is a typographical error.

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Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 3, 8, 9, 12-15, 36, 42, 43, 49-54, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ralph 5,272,016.

Ralph teaches a multi layer biaxially oriented shrink film comprising metallocene catalyzed polyolefins (VLDPE) (EXACT, a metallocene catalyzed ethylene/butene copolymer available from Exxon, (column 22, line 45; Certificate of Correction). EXACT polymers are the homogeneous ethylene copolymers used by the applicants in their examples. The before mentioned copolymers are mixed in various proportions with an alpha-olefin elastomer having a density of below about 0.90 g/cm³ (Abstract) to produce multi layer symmetrical films (Column 22, Table L) with superior strength, abuse resistance (column 2, line 63), and heat sealability (column 3, line 5), in which EXACT polymer are useful. They teach that VLDPE having density of about 0.900 or higher can be used, and the recited materials is an ethylene-butene copolymer (certificate of correction). Regarding claim 15, second surface layer can be considered an inner layer in view of the applicants structures in the examples. Regarding claims 53 and 54, the films are irradiated before or after biaxial orientation as claimed. Regarding claims 50-52, determining the optimal temperature of orientation is well within the skill of the art since this feature relates to the temperature of crystallization of the

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resins in the polymer film (column 2, lines 1+) and the films taught by Ralph at a temperature of 90 °C. While the orientation temperature is not specified, the orientation must have taken place at a temperature near 90 °C such that shrinkage would occur at that temperature since the temperature of orientation is related to the temperature at which shrinkage occurs.

While Ralph does not teach examples of films having a density of greater than “about 0.906 g/cc”, the claimed densities would overlap the “about .900 g/cc” or greater taught by Ralph.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used other commercially available EXACT, VLDPE resins having densities higher than 0.900 g/cc since EXACT resins in the blend produce films having good shrink properties.

Furthermore, there does not appear to be any distinction in the behavior of a films having a resin having a density of greater than about “0.906 g/cc” and films having a density in the range of about “0.900 g/cc” the numbers are so close, they appear to overlap. In any event these differences in density would be minor obvious variations and would be expected to have the same general properties. *See Titanium Metals Corporation vs Banner*, 778 F. d. 775, 227 USPQ 773 (Fed. Cir. 1985).

Regarding claims 50-52, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the orientation temperature of the films taught by Ralph depending on the crystallinity of the polymers used.

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2. Claims 44-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ralph 5,272,016 in view of the applicants' admissions page 10, paragraph 3.

Ralph, as discussed above, teach oriented films; however, he is silent regarding some of the processing conditions under which orientation occurs. However, the applicants state on page 10 that orientation methods are well known to those skilled in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used conventional orientation methods of the types discussed by the applicants as being well know to those in the art in order to produce the shrinkable films taught by Ralph.

3. Claims 1, 2, 3, 5, 6, 8-13, 36, 42-49, 53, and 56 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schoenberg (4,551,380) in view of Schut "Enter a new Generation of Polyolefins" Nov. 1991 Plastics Technology and Van der Sanden et al. "EXACT Linear Polymers of Enhanced Sealing Performance" ANTEC 1992.

Schoenberg teach a heat sealable shrinkable symmetric three layer laminate film comprising a core of linear low density polyethylene (density about 0.90 g/cc) bounded by two surface layers (column 1, line 6). The surface layers comprise a blend of: (1) linear low density polyethylene (LLDPE) , (2) a linear medium density polyethylene, and (3) an ethylene/vinyl acetate copolymer (Claim 3). Said LLDPE has a density about 0.900 to 0.925 g/cm³ (column 8, lines 45-50). Furthermore, the film can be cross linked by irradiation (column 15, line 5+) and orientation of the

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film can occur using conventional methods such as tenter framing and double bubble methods (column 2, lines 1-18). However, Schoenberg does not teach the use of polyolefins produced using a single site metallocene catalyst.

Schut teaches in a trade journal article that Exxon is producing a new line of linear low density polyolefins made using homogeneous single site metallocene catalysts, wherein said polyolefins have a density of at least 0.90 g/cc. Schut also teaches that these polymers would be used in blends or multi-layer films. These polyolefins have physical characteristics far superior to traditional polyolefins produced from Ziegler / Natta catalysis. For example: metallocene catalyzed polyolefins have lower heat-seal initiation temperatures, higher strength (Dart impact results), and better clarity. The superior attributes of these metallocene catalyzed polyolefins are further elaborated in Van der Sanden et al; and they further teach that these polyolefins are a choice material in the production of heat sealable films. Finally it should be noted that metallocene catalyzed polyolefins (1-butene, 1-hexene, or 1-octene /ethylene copolymers) are commercially available from Exxon in the form of "EXACT."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used commercially available metallocene catalyzed LLDPE of the type taught by Schut and Van der Sanden et al. in the laminate structure of Schoenberg in order to produce clear puncture resistant films with improved sealability and strength.

Regarding claims 42-49, 53, and 56, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have produced the films taught by Schoenberg using

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conventional art recognized orientation methods since Schoenberg recognizes that various conventional methods would be useful.

4. Claims 1, 2, 12, 13, 18-41, 43, 47, 49-52, and 54-56 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Evert et al. (5,055,328) in view of Schut "Enter a new Generation of Polyolefins" Nov. 1991 Plastics Technology and Van der Sanden et al. "Exact Linear Polymers of Enhanced Sealing Performance" ANTEC 1992.

Evert et al. teach a multi layer cross linked laminate film comprising a core sandwiched between an inner layer and an outer layer. The heat sealable inner and outer layers comprise (column 7, line 1+; column 8, line 62+) a blend of at least 50% EVA and other suitable polymers and copolymers including α -olefins such as LLDPE and VLDPE. The heat sealable layer may also comprise polypropylene, ethylene-polypropylene copolymer, or an ionomer (neutralized ethylene-acrylic acid polymer).

The core (column 8, line 29) can comprise nylon, hydrolyzed ethylene/vinyl acetate copolymer, vinylidene chloride/vinyl chloride copolymer, or vinylidene chloride/methyl acrylate copolymer, but the vinylidene chloride/vinyl chloride copolymer is not a preferred material because it discolours during irradiation treatment. These films are shrinkable at 90 °C, and as discussed above it is reasonable to believe that these films have been oriented at a temperature near 90° C. The films have also been oriented using a double bubble method and irradiated following the orientation step (column 10, lines 18+). They also teach in the back ground of the invention that multilayer films can

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be produced by lamination or extrusion coating, but these methods require additional steps (column 2, lines 50+). However, Evert et al. does not specify the use of LLDPE produced by metallocene.

As discussed above Van der Sanden et al. and Schut teach that commercially available metallocene catalyzed LLDPE have physical properties far superior to those of analogous LLDPE formed by Ziegler-Natta catalysis.

Nevertheless, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used commercially available metallocene catalyzed LLDPE as discussed by Van der Sanden and Schut in the laminate structure of Evert et al. in order to produce clear films with superior strength and improved heat sealability.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have to have extrusion coated the films taught by Evert et al. with a layer of vinylidene containing barrier material instead of coextruding the layers together since this would be an alternative route of producing the mulilayer films in which the end result would still be the same multi-layer film structure. While this route would require additional steps, it still is an art accepted method of forming multilayer films.

5. Claims 1, 2, 12-15, 18-22, 23-27, 28-31, 33-41 are rejected under 35 U.S.C. § 103 as being unpatentable over Newsome et al. (4,457,960) in view of in view of Schut "Enter a new Generation of Polyolefins" Nov. 1991 Plastics Technology and Van der Sanden et al. "Exact Linear Polymers of Enhanced Sealing Performance" ANTEC 1992.

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Newsome et al. teach multi layer films comprising a barrier layer. The film structure can have both three layer and five layer embodiments; wherein the five layer structure can be either symmetrical or asymmetrical (Examples of the laminate structure: column 7, line 64+), and the films must be strong and abuse resistant. The films can also comprise LLDPE which can compose the core, the inner layers, or the outer layers of the films either as a separate layer or as a blend depending on the embodiment. The barrier layer can be either ethylene/vinyl alcohol or saran. However, Newsome et al. do not teach the use of metallocene catalyzed LLDPE.

As discussed above Van der Sanden et al. and Schut teach that commercially available metallocene catalyzed LLDPE have physical properties far superior to that of analogous LLDPE formed by Ziegler-Natta catalysis. Furthermore, Schut teaches that EXXPOL EXACT-101 has a total impact strength of 107 in.-lb.

It would have been obvious to one of ordinary skill in the art at the time of invention was made to have used commercially available metallocene catalyzed LLDPE of the type taught by Van der Sanden et al. and Schut in the laminate structure of Newsome in order to produce films with superior strength and performance.

6. Claims 1, 3, 4, 5, 6, 12, 14, 28, 35, 42, 43, 47, 49, 54, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilhoit (5,403,448).

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Wilhoit teach that blends of VLDPE, EVA, and a plastomer are used to produce heat shrinkable single and multi-layer films. These films are biaxially oriented as by double bubble biaxial orientation in which irradiation to achieve cross linking is done following biaxial orientation (column 11, lines 50+). The homogeneous plastomer has a density of below about 0.900 g/cc and a molecular weight distribution of less than 3; (table on column 5) this would correspond to the claimed linear homogeneous polymer. These materials are made by Mitusi using a single site vanadium catalyst and have homogeneous not heterogeneous properties.

The VLDPE polymers used are heterogeneous in nature (table column 5), having molecular weight distributions above about three and having at least two melting points. Examples of VLDPE polymers recited have densities of both less and greater than about 0.90 g/cc as claimed (Table C).

The essential difference between what is claimed and what is taught by Wilhoit is the specific use of homogeneous linear polymer (plastomer) having a density of greater than about 0.906 g/cc. However, the claimed ranges overlap that taught by Wilhoit because both the prior art and the applicants use the term about which gives enough latitude to the densities of the homogeneous polymer to have overlapping values. Accordingly, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made, since it has been held that choosing the overlapping portion, of the range taught in the prior art and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549. Furthermore, it has been held that a range of "more than 5%" would overlap a

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disclosure of 1-5%, *In re Wertheim*, 541 F. d. 257, 191 USPQ (CCPA 1976), *In re Woodruff*, 919 F.d. 1575, 16 USPQ2d. 1934 (Fed. Cir. 1990).

7. Claim 1, 2, 6-11, 15-17, 42, 43, 47, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (4,532,189) in view Schut "Enter a new Generation of Polyolefins" Nov. 1991 Plastics Technology and Van der Sanden et al. "Exact Linear Polymers of Enhanced Sealing Performance" ANTEC 1992.

Mueller et al. teach heat shrinkable multi-layer films comprising LLDPE wherein DOWLEX 2054 is a commercially available LLDPE (examples I, II, and III). Moreover, example II shows LLDPE blended with ethylene vinyl acetate used in the core layer of a multilayer film. Furthermore, these films have improved optical properties (column 1, lines 13+). The core layer can also comprise a blend of LLDPE and LDPE, (an example of a homopolymer)(column 5, lines 22; column 3, line 54). These films are also used in shrink/ heat seal applications (column 2, lines 5+).

However, they are silent regarding the use of homogeneous linear polymers having a density of greater than about 0.906 g/cc.

Schut teaches in a trade journal article that Exxon is producing a new line of linear low density polyolefins made using homogeneous single site metallocene catalysts, wherein said polyolefins have a density of at least 0.90 g/cc. These polyolefins have physical characteristics far superior to traditional polyolefins produced from Ziegler / Natta catalysis. For example: metallocene catalyzed polyolefins have lower heat-seal initiation temperatures, higher strength (Dart impact results), and

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better clarity. The superior attributes of these metallocene catalyzed polyolefins are further elaborated in Van der Sanden et al; and they further teach that these polyolefins are a choice material in the production of heat sealable films. Finally it should be noted that metallocene catalyzed polyolefins (1-butene, 1-hexene, or 1-octene /ethylene copolymers) are commercially available from Exxon in the form of "EXACT."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used commercially available metallocene catalyzed LLDPE of the type taught by Schut and Van der Sanden et al. in the surface layers or the core layer of the laminate structure of Mueller in order to produce clear puncture resistant films with improved strength and in the case of the surface layer, improved heat sealing properties.

Response to Arguments

8. Applicant's arguments filed 11-18-99 and 2-7-99 have been fully considered but they are not fully persuasive.

The examiner has withdrawn the rejections based on Lai. The examiner and the applicants agree that the polymers produced by Lai et al (Dow) are "substantially linear" in nature and are not "linear" as claimed. The claimed materials truly linear species which do not have the long chain branching characteristic of the homogeneous polymers made by Lai et al. using a constrained geometry catalyst.

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The applicants have argued that the materials produced by Exxon do not lend themselves to the production of mono-layer films because of melt strength considerations. However, Shut teaches that initial uses of these materials would be layers and blends (page 17, column 3). The applicants claims are directed to films which are either multilayer in nature or open to the presence of other polymers or layers. Thus the applicants arguments with respect to melt strength appear to be commensurate with what is already recognized by the prior art.

While the applicants argue that Shut and Van der Sanden do not recognize that homogeneous polymers are specifically useful in shrink film applications, they do teach that they are useful in the production film and would be useful in blend and in multilayer films. Newsome (4,457,960), Schoenberg (4,551,380), Evert et al. (5,055,328) and Mueller (4,532,189) all teach multilayer films which have shrinkable properties and the motivation to combine is based on the fact that each of these primary references teaches multilayer films and blend.

The applicants arguments with respect to increased shrink properties is not persuasive. It is recognized in the art when comparing two polymers having the same density one made by Ziegler / Natta and one made by a single site catalysis (EXACT) (Enter a New Generation of Polyolefins, Shut, table 1), the homogeneous polymer made by single site catalysis will have a lower melting point. If films comprising these polymers are processed under the same conditions including the orientation temperature, the film made from the homogeneous polymer would inherently have a higher degree of orientation and which results in a greater degree of shrinkability at the same temperature because

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of this increased temperature differential . See also Ralph (5,272,016) which discusses orientation temperatures (column 2, paragraph 1).

The applicants state that they have improved impact strength in structures having homogeneous polymers. However, the examiner takes the position that this is not unexpected since Shut (page 15) teach that films made from the EXACT resins have improve impact properties over those made of polymers made by conventional Ziegler-Natta catalysis.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. Lawrence Tarazano whose telephone number is (703) 308-2379. The examiner can normally be reached on M-F from 8:30 am to 5:30 pm.

The official fax number for the art unit is (703)-305-3599. The special fax number for amendments after final is (703)-305-5408. The number for unofficial faxes is (703)-305-5436.

D. Lawrence Tarazano
Patent Examiner

April 20, 2000

A handwritten signature in cursive script, appearing to read "D. Lawrence Tarazano", written in black ink.